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# **HOW TO FIGHT TERRORISM: ALTERNATIVES TO DETERRENCE**

by

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**Abstract**

Deterrence has been a crucial element in fighting terrorism, both in actual politics and rational choice analyses of terrorism. But there are superior strategies to deterrence. One is to make terrorist attacks less attractive. Another to raise the opportunity cost – rather than the material cost – to terrorists. These alternative strategies effectively dissuade potential terrorists. The strategies suggested here build on the “benevolence” system and tend to produce a positive sum game among the interacting parties. In contrast, the deterrence system is based on “threats” and tends to produce a negative sum game interaction.

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## 1. INTRODUCTION

Politics has always been committed to fighting terrorism by using deterrence. Terrorists must be dissuaded from attacking by threats of heavy sanctions and by using police and military forces to fight them<sup>1</sup>. The reaction to the terrorist attacks of September 11, 2001 is a striking example. This strategy has also been central in rational choice analyses of terrorism. Most studies start with the model of subjective expected utility maximisation<sup>2</sup>. According to this approach, the incentive to undertake terrorist acts is the smaller the larger the expected punishment, i.e. the probability of being caught multiplied by the size of the fine<sup>3</sup>.

This paper presents an alternative view. We argue that there are superior strategies to deterrence. They are effective in the sense of dissuading potential terrorists from attacking. At the same time the overall consequences are favourable. The strategies suggested here build on the “benevolence ” system<sup>4</sup>. It tends to produce a *positive sum game* among the interacting parties and therewith contributes to a peaceful political environment. In contrast, the deterrence system is based on “threats”. They tend to produce a *negative sum game* interaction and lead to further conflict.

The next section analyses the consequences of applying deterrence by using a simple graphic model of the incentives faced by potential terrorists. The problems of anti-terrorist policy using deterrence are pointed out. Section 3 presents a first alternative to deterrence, namely to reduce terrorist attacks by making them less attractive to terrorists. The fourth section discusses the general strategy of raising the opportunity cost – rather than the material cost – to terrorists. Three specific strategies of raising the

opportunity cost to terrorists are suggested. Section 5 evaluates the weaknesses and strengths of the general strategy. The following section considers the politico-economic question of how likely it is that these “benevolence” strategies will be pursued. Section 7 draws conclusions.

## 2. DETERRENCE POLICY

The terrorists can be characterised as rational actors, choosing between legal activities and terrorist activities to promote their political goals (see e.g. Lichbach 1987). With the help of a simple graphical model that identifies the incentives faced by prospective terrorists, the effect of deterrence on the amount of terrorism can be illustrated.

Figure 1a depicts the decision faced by the terrorists. The budget constraint depends on the expected cost of terrorism and all other activities. More precisely, the slope of a terrorist’s budget constraint is the negative of the ratio of the expected costs of terrorism and other activities. The cost of terrorism consists of material resources, collecting information, as well as the time required to prepare the attacks. Moreover, expected costs also reflect the danger involved in actually carrying out the act (e.g. the expected probability of being caught and imprisoned and the expected sentence). The terrorists derive utility from both, legal and terrorist, activities. The shape of the indifference curve depends on the preferences or the motivation of the terrorists. Highly intrinsically motivated terrorists, or fanatics, are convinced they are doing the right thing, irrespective of incentives from outside. In this case, the indifference curve is very steep. Such an indifference curve could also be explained by intertemporal utility considerations. A suicide bomber may place a very high value on the life hereafter and

trades off current consumption for the delights of 72 white virgins in the afterlife.<sup>5</sup> The policy implications of such extreme preferences are discussed in section 5. But terrorism is often undertaken to achieve a particular political goal rather than as an end in itself. The shape of the indifference curve is therefore not only determined by the preferences of the terrorist, but also by the effectiveness of terrorism in promoting a political goal. The tangency between the indifference curve and the budget constraint identifies the equilibrium extent and intensity of terrorism  $T^*$ . Available evidence suggests that terrorists systematically react to externally offered incentives (see e.g. Sandler and Scott 1987).

### **Figures 1a and 1b about here**

Deterrence policy raises the cost of terrorist acts by increasing the risk of apprehension and by punishing the perpetrators more severely. But deterrence policy does not solely depend on the incentives of the potential terrorists. It also seeks to prevent terrorist acts by making them more difficult to undertake. A deterrence policy is therefore in many cases able to raise the perceived cost of terrorism. In figure 1b, the budget constraint rotates inwards along the terrorism-axis, resulting in a smaller equilibrium amount of terrorism.

### **3. MAKING TERRORISM LESS ATTRACTIVE**

Terrorism is often seen as a specific form of political participation: “Terrorists attempt to assert their interests in the complicated process of deciding ‘who gets what, when, how’, the process of politics” (Badey 1998, 96). The ultimate aims of terrorism are – among others – the redistribution of power and property rights and the extortion of

rents. In order to achieve these goals terrorists have three main tactical goals (see e.g. Schelling 1991):

- Terrorists seek publicity in order to make their cause more widely known. They prefer to undertake terrorist acts in cities, where they can be assured of media attention.
- Terrorists seek to destabilise the polity. When the political system's legitimacy is eroded, the terrorists' chances of achieving their goal improve.
- Terrorists seek to damage the economy. They want to impose material cost on the population in order to make them yield to their demands<sup>6</sup>. The more an economy is affected by terrorist acts, the higher is the terrorists' marginal benefit.

The equilibrium amount of terrorist acts may be diminished by reducing these marginal benefits to terrorists. This reduces the marginal rate of substitution of all other activities for terrorism as shown in figure 2.

### **Figure 2 about here**

Several anti-terrorism policies based on reducing the marginal benefits are discussed in the literature. Frey (1988; 1999) suggests that the authorities should refrain from attributing a particular terrorist incident to any one group. Rather, they should stress that many different actors must be considered as possible perpetrators. Such an information policy markedly reduces terrorists' benefits in the form of publicity.

Frey and Luechinger (2002) propose to immunise a country against terrorist attacks by decentralising activity, both with respect to the polity and the economy. The basic idea is that a polity and society with many different centres is difficult to destabilise. The single centre is less essential for the polity and economy and therefore also of less symbolic value. If one of the centres is hit by a terrorist attack, other centres can take over the tasks. The attraction of violent actions on the part of terrorists is diminished as they prove to have less effect on the political stability and aggregate economic activity. According to Frey and Luechinger decentralisation as an anti-terrorism strategy may take two forms<sup>7</sup>:

Firstly, political power is distributed between a number of different political actors (classical division of power, democracy and rule of law) and across various levels of government (federalism).

Second, a market economy is based on an extreme form of decentralisation of decision-making and implementation, and is therefore less vulnerable to terrorist attacks than a highly regulated and monopolised economy.

The authors further assert that the policies of fighting terrorism by using deterrence and by decentralisation may interact if deterrence induces a centralisation of decision-making in the polity and economy.<sup>8</sup> In this case, deterrence entails two countervailing effects and it remains open whether the equilibrium amount of terrorist activity actually falls, as generally expected.<sup>9</sup>



Sandler, Tschirhart and Cauley 1983, Lapan and Sandler 1988, Scott 1993, Sandler and Enders 2002 discuss the frequently proposed and applied strategy of never to negotiate with terrorists in hostage-taking incidents. According to the conventional wisdom, this strategy would discourage the taking of hostages because the terrorists know they cannot expect to benefit from such acts. The authors identify on a theoretical basis the rather restrictive scenarios in which a no-negotiation strategy is desirable in the case of a credible precommitment. A common finding is that a no-negotiation strategy is only effective in preventing terrorist attacks if the terrorists are solely motivated by concessions and if there is uncertainty about the costs associated with different outcomes for the government and/or the terrorists.

#### 4. OPENING UP ALTERNATIVES TO TERRORISTS

We argue that an effective way to fight terrorism is to raise the *opportunity costs* to terrorists. This differs fundamentally from traditional deterrence policy, which seeks to raise the *material* cost to potential terrorists. Indeed, the two approaches imply quite different policies.

The opportunity costs faced by potential terrorists consist in the utility they could gain by not engaging in terrorism. These are the activities they can undertake outside of terrorism. Higher opportunity costs reduce the willingness of a (potential) terrorist to commit terrorist activities. An increase in the opportunity costs or, equivalently, a reduction in the costs of all other activities, therefore reduces the amount of terrorism. As shown in figure 3, the budget constraint rotates upwards along the axis indicating that “Other Activities” and the equilibrium amount of terrorist acts is lower.

**Figure 3 about here**

Such a strategy has several advantages over other anti-terrorist policies:

- (1) Due to a wider scope of opportunities outside of terrorist activities a person's dependence on the terrorist group is reduced. Exit is facilitated.
- (2) A conflict between terrorist and other activities is created, which produces tensions within the terrorist organisation. Nobody knows who will succumb to the outside attractions and become a "traitor" by leaving the group. This diminishes the effectiveness of the terrorist group. In contrast, a deterrence policy strengthens solidarity among the group members (see e.g. Wintrobe 2002a).
- (3) The interaction between the terrorists and all other people and groups is turned into a positive sum interaction. The chances of finding a peaceful solution are improved.<sup>10</sup>

An obvious possibility is to raise opportunity costs by increasing income in peaceable occupations. The more an individual can gain from participating in an ordinary activity, the less he or she is inclined to engage in terrorism. The recent experience with Palestinian suicide bombers suggests, however, that the resulting effect is small, if it exists at all. A substantial part of them seem to have above average education and therewith presumably<sup>11</sup> better outside opportunities than completely uneducated,

destitute persons. For that reason, we propose three more specific strategies to *directly* raise (potential) terrorists' opportunity costs.

#### *Visits to other countries*

Persons inclined to terrorist ideas and actions can be invited to visit foreign countries. Universities and research institutes, for example, can offer such persons the opportunity of discussing their ideology with intellectuals. The guests may, moreover, pursue their own studies. It is to be expected that the confrontation with the liberal ideas existing in such places of learning will mellow their terrorist inclinations. The very least which would be achieved is that the (potential) terrorists have access to new and radically different ideas, compared to the situation in which they live within a closed circle of other terrorists.

According to Hardin's (2002) economic theory of knowledge, interaction between groups is likely to reduce extremist views. Hardin starts with the premise that a person's knowledge depends on the costs and benefits of acquiring pieces of knowledge and then applying them. Because of the high cost of discovering and verifying every bit of knowledge, people typically rely on sources of authority and the society in which they spend most of their lives (see also Hardin 1992). A person has also little incentive to acquire knowledge and beliefs that are at odds with the beliefs of the society he or she lives in. Extremist views are therefore more likely to flourish in isolated groups of like-minded people. This is a generally recognised fact in research on religious sects (see e.g. Knoke 1990). Moreover, extreme views serve as norms of exclusion (Hardin 2002). Extremism therefore reinforces segregation and *vice versa*. Wintrobe (2002b) and

Breton and Dalmazzone (2002) stress the role of political entrepreneurs, exploiting and magnifying the differences between the isolated groups. Similarly, Glaeser (2002) argues that politicians supply hatred<sup>12</sup> if it complements their policies or in Glaeser's words, if "hatred makes a particular politician's policies more appealing" (4). He further argues that the demand for hatred falls as consumers interact with the targeted group. He explains the lower demand of hatred due to social interactions by referring to Becker (1957), who discusses the lowering effect of hatred on returns in social interaction.

Terrorism, as well as deterrence, can be seen in this context as an attempt to enhance segregation and thereby strengthen cohesiveness. Besides the higher opportunity cost of terrorism in the case of an invitation to foreign countries, breaking up this vicious circle of segregation and extremism may therefore be promising in lowering the inclination of terrorists to participate in violent activities. Analytically speaking, this reflects a change in preferences and could be depicted in the graphical model by a flatter indifference curve.

There is also abundant evidence from experimental research that communication between players (and even identification; see Frey and Bohnet 1999a, 1999b) increases cooperation. On the basis of his meta-analysis of social-dilemma experiments, Sally (1995, 61) concludes that "the experimental evidence shows quite clearly that discussion has an extremely positive effect on subjects' willingness to cooperate". Sociological studies indicate that (residential) segregation is often largely responsible for repeated ethnic conflict (see Harris 1979 and Whyte 1986 for the case of Ireland, Diez Medrano 1994 for the Basque Country and Hasson 1996 for Israel).

### *Principal witness programmes*

Persons engaged in terrorist movements can be offered incentives such as money, reduced punishment and a secure future life if they are prepared to leave the organisation they are involved with and are prepared to talk about it and its project. A member's opportunity costs of remaining a terrorist are therewith increased. This method has indeed sometimes been used, for example in the case of the *Brigate Rosse* (Red Brigades) in Italy, the *Rote Armee Fraktion* (Red Army Faction) in Germany and the *Action Directe* (Direct Action) in France. In Italy a new law, the *legge sui pentiti* (law on repentants) left it at the discretion of the courts to reduce sentences quite substantially where convicted terrorists provided tangible information leading to the arrest and conviction of fellow-terrorists. The implementation of this principal witness programme turned out to be an overwhelming success. Wilkinson (2000, 98) states, that “[i]t was brilliantly successful in providing the police with detailed information which helped to crack open the Red Brigade cells and columns”. This success suggests that it is possible to go one step further and address terrorists not yet convicted.

### *Contact, discussion process and political participation*

The terrorists can be involved in a discussion process, which takes their goals and grievances seriously and which tries to see whether compromises are feasible. Moreover, terrorists can be granted access to the normal political process. This lowers the costs of pursuing the political goal by legal means and hence raises the opportunity costs of terrorism.

This is not a utopian solution. In the Netherlands, for example, “access to the media is practised to the fullest possible extent, even by terrorist sympathizers” (Chalk 1995, 33). The last terrorist campaign in Switzerland ended with a direct democratic decision on the disputed issue (Jenkins 1986, Rom 2000). In Switzerland in the 1940s, a separatist movement in the remote northern districts of the Bernese Jura demanded secession from Canton Berne. Because of an uncompromising attitude on the part of the Bernese government, the conflict escalated. In the 1960s, the *Front de libération jurassien* (Jurassian Liberation Front) and the *Béliers* (Battering-Rams) were formed. They were responsible for a number of incendiary and bomb attacks. It was only after the Bernese government decided that the electorate of the Bernese Jura should itself determine its own political future that the conflict de-escalated. A popular referendum led to the establishment of a new canton. In subsequent referenda, some communes and districts voted in favour of remaining part of Canton Berne. The *Front de libération jurassien* and the *Béliers* continued their attacks, with the objective of a unification of all the districts. However, they lost popular support and soon ceased to exist.

It may well be that the various efforts to ban the political wings of terrorist organisations, like the current effort of the Spanish government to ban *Herri Batasuna* (Peoples’ Unity) (see e.g. Economist 2002b), leads to unintended and counterproductive results.

This is, of course, a weak form of anti-terrorist policy, and is not always possible without giving up cherished values. But there are quite a number of cases in which

former “terrorists” later turn out to be quite normal politicians and several of them were even awarded the Nobel Peace Prize.<sup>13</sup>

The anti-terrorism policy proposed here has some common features with the policy often put forward of fighting terrorism by alleviating the causes (see Kirk 1983 for extensive references to the literature). However, a crucial difference between the two policies is that the one proposed here can also be adopted by governments who are initially not involved, and even by private persons and organisations.

## 5. EVALUATION

As has become clear from the three specific strategies suggested, increasing the *opportunity* costs to terrorists represent a completely different approach than conventional anti-terrorist policy using deterrence. A conscious effort is made to break the organisational and mental dependence of persons on the terrorist organisations by offering them *more favourable* alternatives. Deterrence policy does the opposite: the costs of staying a terrorist are raised.

The policy of opening up alternatives to the terrorists is far from ideal. It has some important disadvantages. But it also has strong advantages. Both are discussed in the following.

### *Disadvantages*

There are four possible major weaknesses in the effort to raise terrorists’ opportunity costs:

(1) It may well be that the strategy does not work. There can be various reasons for this.

One is that the incentives created are insufficient to affect terrorists. This may be especially true for highly intrinsically motivated or fanatical terrorists. In this case, the strategy, in order to be effective, would require extreme incentives and would entail considerable costs. The incentives are therefore likely to be ineffective in diverting the hard core of terrorist organisations to participate in more legal activities. But they may prove successful in restraining the *Umfeld*<sup>14</sup> of the terrorists from terrorist activities. Without the support of the *Umfeld*, the hard core of the terrorist organisations will at most only be able to undertake low scale terrorist activities.

(2) Another reason may be that the leaders of the terrorist movements undertake a counterstrategy (e.g. by offering similarly appreciated alternatives or by threatening dire punishment) or act strategically (e.g. by sending some trusted members as “principal witness”). But such counterstrategies are costly for the terrorist movement.

Most importantly, the deterrence strategy often does not work well either. As already discussed, a deterrence strategy is also susceptible to counterstrategies by the terrorists and many examples demonstrate that terrorist movements have survived despite a strong deterrence policy. In a comparative perspective, the strategy of offering alternatives may not fare so badly.



- (3) The “benevolence” strategy could create perverse incentives in which some individuals are induced to engage in terrorism in order to receive future rewards from abandoning terrorist activities (see e.g. Shahin and Islam 1992, 323; Krueger and Malecková 2002, 2). This argument applies to positive incentives in a wide range of policy areas, for example compensation payments in environmental affairs (see e.g. Bloechliger and Staehelin-Witt 1993, 62-63) or positive sanctions in the case of international cooperation (see e.g. Cortright and Lopez 1998). However, these cases show, that, in many cases, the implementation of positive incentives is more successful at promoting cooperation than deterrent threats. For example, Bernauer and Ruloff (1999), focusing on horizontal nuclear proliferation, demonstrate that positive incentives have the potential of producing significant behavioural changes in the short term and fostering more stable solutions to the problem in the long run.

Following the same line of reasoning, one could argue that “benevolence” strategy induces entry because exit is facilitated. Rational actors, anticipating the ease of exit, are more inclined to entry in the first place. This is a common argument in the discussion about different drug policies. In reality, however, there is no evidence that ease of exit induces more entry. Moreover, repressive policies prove to be ineffective (Miron and Zwiebel 1995, Frey 1997).

- (4) The strategy may be considered immoral and therefore rejected. It may be thought that the terrorists are rewarded for their illegal and often heinous acts. This may certainly sometimes be the case, but it should be kept in mind that there are many

cases in which “terrorists” were later fully integrated in society. In these cases, the argument loses much of its force.

### *Strengths*

There are two important advantages of the strategy of offering alternatives to terrorists:

- (1) The whole interaction between terrorists and the government becomes characterised by a *positive sum game*. Both sides can benefit. The effort of the government is no longer directed towards destruction. Rather, the government makes an effort to raise the utility of those terrorists who choose to enter the programmes offered. This interaction – even if many terrorists do not participate – has a better chance of producing a Pareto-superior outcome. In contrast, deterrence policy by necessity produces a worse position for both sides. The terrorists are punished (incarcerated, killed, etc), while the government often has to raise large sums of money to undertake their deterrence strategy. The interaction between the Palestinian terrorists and the Israeli government provides a good illustration. There can be no doubt that both sides are much worse off than before.
- (2) The strategy *undermines the cohesiveness of the terrorist organisation*. The incentive to leave is a strong threat to the organisation. The terrorist leaders no longer know whom to trust because, after all, most persons can succumb to temptation. An effort to counteract these temptations by prohibiting members from taking up the attractive offers (e.g. to spend a period of time at a research institute) leads to conflicts between leaders and rank and file. When good outside offers are

available to the members, the leaders tend to lose control. The terrorist organisation's effectiveness is thereby reduced.

## 6. POLITICO-ECONOMIC CONSIDERATIONS

Does the policy of offering alternatives to terrorists have any chance in politics? At present, they are rather slim (but that should not discourage the considerations of such alternatives).

As discussed, the strategies suggested tend to produce a *positive sum game*. However, the unilateral use of violence or force may lead to a greater benefit for either party in the absence of a violent reaction on the part of the other party. A peaceful solution to a conflict is therefore plagued by the collective action problem. In a conflict between terrorists and the government, the parties are unlikely to be able to overcome the collective action problem. Several conditions for a cooperative solution are not met (Ostrom 1990; Ostrom, Gardner and Walker 1994; Ostrom and Walker 1997). Without credible commitments from both sides, communication, which is crucial for cooperation, is difficult to maintain. There is no accurate information regarding the costs and benefits of a peaceful strategy prior to its implementation. The concerned parties are heterogeneous in regard to their information and preferences, and do not share generalised norms of reciprocity and trust. Finally, monitoring and sanctioning mechanisms are exacerbated by the covert nature of terrorist and counter-terrorist activities.

Even if the "benevolence" strategy leads to a superior outcome for the targeted society as a whole, the government may prefer a deterrence strategy based on "threats". The

interests of most well-organised groups are clearly aligned against a “benevolence” strategy. Two major organisations in society, the police and the army, must expect to lose. They receive fewer funds and can no longer profit from a deterrence policy in which they play a crucial role. The alternative strategy does not build on their services; on the contrary. The “politically” defined costs of a deterrence policy therefore differ markedly from those “economically” defined (Frey 1983). The government is likely to favour the well-organised groups, the army and the police, at the expense of the remaining population which experiences only a small reduction in its utility.

The government may moreover prefer a deterrence policy, because they can therewith demonstrate to the population that they are determined to “fight terrorism at all costs”. The “macho”-image may help them to win elections, especially if there is no open discussion of the merits and demerits of the various strategies. In contrast to the utility of a deterrence policy, the benefits of alternative strategies are not directly attributed to the government in power. A “benevolence” strategy reduces the decision power of the politicians, especially if the conflict is settled by way of an open discussion and a (direct) democratic decision.

The strategy of offering opportunities has the best chance of being undertaken when deterrence policy has failed. In such times of crisis, the various groups involved may turn to unorthodox policies.

## 7. CONCLUSIONS

Politics, as well as rational choice analysis, have always been committed to fighting terrorism by deterrence. We argue that the application of the rational choice approach

offers a wider range of anti-terrorism policies. A first alternative to deterrence is to reduce terrorist attacks by making them less attractive to terrorists. Another strategy seeks to raise the opportunity cost to terrorists. Specifically, we suggest three specific strategies: visits to other countries, principal witness programmes, and formal contact, discussion processes and access to normal political participation. The strategy of offering alternatives to terrorists has both weaknesses and strengths. But when the strategy is compared to deterrence policy, the favourable features prevail. However, it seems to be quite unlikely that these “benevolence” strategies will be pursued. They are neither in the interests of the main actors (the government, police and army) in the targeted country, nor in those of the terrorist leadership. The strategy may have the best chance of being introduced when the deterrence strategy has failed.

We are not inclined to believe that the “benevolence” system is the only effective strategy, nor that it works in every case. Rather, we think that one has to adopt a mixture of different strategies, depending on the actual type of terrorist organisation one is dealing with. There may also be policies that combine the characteristics of both, policies based on “threat” and policies based on “benevolence”. A principal witness program, for example, while providing better outside opportunities for traitors at the same time increases the risk of apprehension for the remaining terrorists. An evaluation of the conditions under which the “benevolence” strategy is relatively more effective than deterrence would be an interesting question for future research.

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## FOOTNOTES

<sup>1</sup> See e.g. Chalk (1995), Kushner (1998) or Wilkinson (2000) for a discussion of the strategies pursued by different target countries in their fight against terrorism.

<sup>2</sup> See e.g. Landes (1978), Kirk (1983), Sandler, Tschirhart and Cauley (1983) and Lichbach (1987). Landes (1978) studies skyjackings in the United States (Following Landes, several contributions concentrate on hostage-taking events: Sandler, Tschirhart, and Cauley 1983, Atkinson, Sandler, and Tschirhart 1987, Sandler and Scott 1987, Lapan and Sandler 1988, Selten 1988, Islam and Shahin 1989, Scott 1991, Shahin and Islam 1992, Scott 1993 and Sandler and Enders 2002). On the basis of his choice-theoretic model, Landes concludes that the decision to hijack an aircraft by a prospective terrorist depends, among other things, on the probability of apprehension, the probability of imprisonment (given apprehension) and the expected sentence. In his empirical analyses, he identified the probability of apprehension and the length of the sentence (if convicted) as significant deterrents. According to his analysis the installment of metal detectors lowered the number of hijackings. However, various authors (Im, Cauley, and Sandler 1987, Cauley and Im 1988, Enders, Sandler and Cauley 1990a and 1990b, and Enders and Sandler 1993, 1995 and 2002) investigate the effectiveness of such anti-terrorism policies. They find that security measures decrease the type of attacks they are designed for. The problem is that the terrorists react by substituting one type of attack with another, often more deadly, one. Therefore, anti-terrorist policies are far less effective and more costly than anticipated. Kash points out another problem (1998, 164): „Significant advancements in counterterrorist approaches have been evenly matched by new terrorist techniques.”

<sup>3</sup> This corresponds to the economic model of crime as developed by Becker 1968. It has routinely been applied to other areas of economics, in particular tax evasion (Allingham and Sandmo 1972; Andreoni, Erard and Feinstein 1998).

<sup>4</sup> We refer here to Boulding (1968; 1970) socio-economic systems (see the discussion in Frey 1978). While he uses the term “love system” for peaceful and positive sum interaction, we prefer the term “benevolence” system.

<sup>5</sup> For a precise definition and further discussion of intrinsic and extrinsic motivation, see e.g. Deci (1975) or Frey (1997). Wintrobe (2002a) points out the weakness of the argument that suicide bombing may be

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explained as a rational choice between current consumption and expected pleasure in the afterlife. A choice like that, to be rational, implies a contract with a Supreme Being. However, the problem is that all of these contracts are unenforceable: “If God is omnipotent [...] He may promise 72 white virgins but actually deliver 72 white *raisins*” (30; emphasis R.W.).

<sup>6</sup> Empirical research has shown that terrorist acts significantly reduce the number of tourists (see Enders and Sandler 1991 for the case of Spain; Enders, Sandler and Parise 1992 and Drakos and Kutan 2001 for Mediterranean countries), as well as foreign direct investment (see Enders and Sandler 1996), gross domestic income and stock prices (see Abadie 2002 for the case of the Basque country) and trade (Nitsch and Schumacher 2002; Walkenhorst and Dihel 2002). The consequences of the attacks of September 11<sup>th</sup>, 2001 on the United States have been estimated to be in excess of \$ 100 billion in direct cost, and as much as \$ 2 trillion in total costs (Navarro and Spencer 2001; see also Becker and Murphy 2001, IMF 2001 and Saxton 2002).

<sup>7</sup> Investigating the impact of terrorism on urbanisation, Glaeser and Shapiro (2001) refer to another aspect of decentralisation that may be important in the context of terrorism, namely that high population densities make urban centres ideal targets.

<sup>8</sup> In order to curb terrorism by deterrence, the central government tends to reduce the democratic and civil rights of citizens (Rathbone and Rowley 2002; Economist 2002a) and to take power away from lower levels of government. More decision-making and implementation power is then vested in one location, making it vulnerable to terrorist attacks.

<sup>9</sup> There are other unintended or even counterproductive consequences of deterrence discussed in the literature. In the political science literature, it is often stressed that government repression against dissidents results in feelings of frustration and anger in larger groups of the population. Deterrence may therefore increase the future mobilisation of dissidents (Lichbach 1987). It is often argued that terrorists aim at provoking such a repressive overreaction (see e.g. Lake 2002). According to Wilkinson (2000) there is abundant evidence that such responses play right into the hands of terrorists and become totally counterproductive. Whenever a deterrence policy is directed against a certain type of attack, the terrorists react by substituting this type of attack with another one (as already discussed in footnote 2). Deterrence has also unintended consequences for countries which are principally not involved. A deterrence policy of a potential target has negative externalities for other potential targets, because it diverts terrorist attacks to

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these other targets. Therefore, without cooperation among the potential targets, each target expends too much effort on deterrence (Sandler and Lapan 1988).

<sup>10</sup> Shahin and Islam (1992) investigate the impact of a policy-mix in a negotiation process in which a government presents a combination package of punishment and reward to hostage-takers. They show that a penalty-reward combination is likely to be Pareto-superior to a policy depending completely on punitive actions. In contrast to the propositions presented in this paper, the rewards proposed by Shahin and Islam can be used only sparingly because otherwise the (potential) hostage-takers anticipate that the government would offer a reward to secure the release of hostages. In this case it is plausible that the amount of terrorism increases.

<sup>11</sup> Persons with higher education may also have higher income expectations. When they are not able to find a job, or only a poorly paid one, they are very disappointed. This may make terrorism more attractive. Investigating the relationship between income, education and participation in terrorist activities in the Middle East, Krueger and Malecková (2002) speculate that the selection of terrorists by terrorist organisations from the pool of potential applicants may lead to a positive relationship between education and participation.

<sup>12</sup> Glaeser defines hatred as „the willingness to sacrifice personally to harm others“ (2002, 2) and refers in his analysis explicitly to terrorism.

<sup>13</sup> Examples are Menachem Begin, one of the principal leaders of *Irgun Zvai Leumi* (National Military Organisation), later Prime Minister of Israel and 1978 Nobel Peace Prize laureate, Nelson Mandela, founder of the *Umkhonto we Sizwe* (Spear of the Nation), 1993 Nobel Peace Prize laureate and president of South Africa, and Yasser Arafat, founding member of the *Al Fatah* (Victory), 1994 Nobel Peace Prize laureate and president of the Palestinian council governing the West Bank and Gaza Strip, to name only the most prominent ones.

<sup>14</sup> Due to the lack of an appropriate English word, we use the German word *Umfeld* (literally translated as environment or periphery), which means rank and file, as well as sympathisers and supporters.



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Figure 1a: Decision Calculus of a Prospective Terrorist

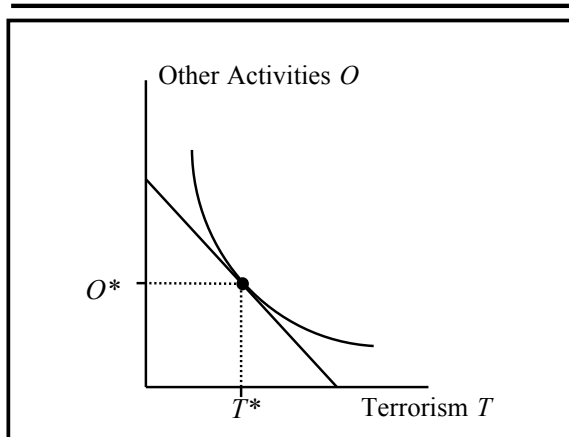


Figure 1b: Increasing the Cost of Terrorism

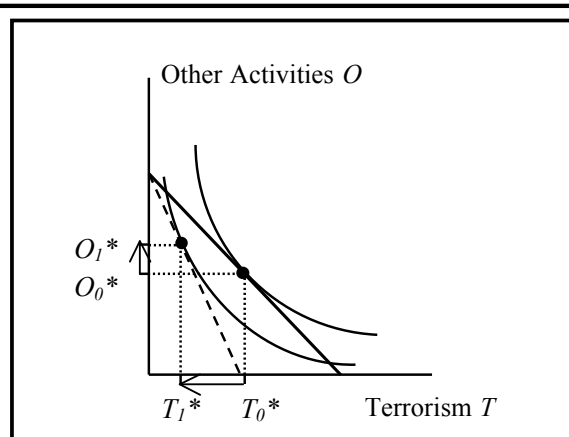
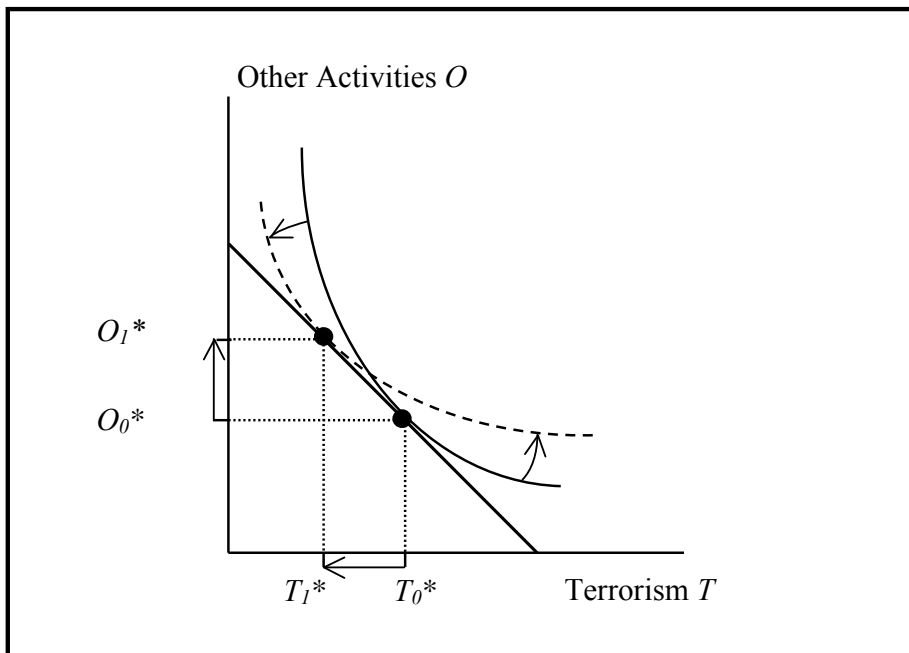


Figure 2: Reducing the Benefits of Terrorism





*Figure 3: Increasing the Opportunity Cost of Terrorism*

